

## SOFTWARE & MECHANICAL ENGINEER

Technical Breadth, Experience, and Insight towards Delivering Immediate Solutions with Long-Term Strategic Vision

### Education & Certifications

**Bachelor of Science in Engineering, 2008** – HARVEY MUDD COLLEGE

**Professional Engineer, Mechanical; CA License #M35629** – BOARD FOR PROFESSIONAL ENGINEERS, LAND SURVEYORS, AND GEOLOGISTS

### Technical Proficiencies

<b>Software Development</b>	<b>Server Client Tools</b>	nodeJS, Python, Linux, C/C++, MongoDB, Network/Proxy. React , Javascript, HTML, CSS. Git, Bash. Windows, Linux. Raspberry Pi, Arduino, Wireless IoT Devices.
<b>Mechanical Engineering</b>	<b>Design Analysis DFM DFA</b>	SolidWorks, Autodesk Inventor, PTC Creo. Static, Dynamic, Thermal, & Fluids Modeling. Simulation (FEA). FMEA. Machining, Sheet Metal, Plastics, Elastomers, Coatings, 3D Printing. Tolerance Analysis, BOM Structure, Automation.

### Work Experience

HEWLETT-PACKARD

(Oct 2016 - Present)

#### **MECHANICAL ENGINEER 3D PRINTING**

*Delivered software tools coupled with mechanical engineering insight to drive improvements to full-color 3D printing solution.*

- Developed thermal camera diagnostic software enabling data cleansing, distillation, 3D segmentation, presentation, and flexible user-interaction for data extraction by combining advantageous data structures with image-processing morphology, heat transfer principles, and open source multidimensional data analysis toolkits. [Python, OpenCV, Scikit-Image, GlueViz]
- Developed visual camera diagnostic software enabling compression, visualization, and quantifiable characterization of powder spread qualities by applying a conditional series of adaptive image-processing algorithms. [Python, Scikit-Image, FFMpeg]
- Augmented in-printer calibration by creating a heuristic-based contour validation process based on review of data containing 200+ identified Type I and Type II errors. [Python]
- Developed a Pub/Sub architecture client-side browser dashboard for printer live-data monitoring. [nodeJS, React, Highcharts, MQTT]
- Prototyped and deployed decentralized data collection and wireless broadcast systems using the ESP8266 NodeMCU and MQTT. [IoT]
- Designed and iterated on powder media overflow collection systems operating in an adverse thermal, radiation, and electrostatic environment. [PTC Creo]
- Created an event-driven queuing and computation management service for routine data-processing tasks. [nodeJS]

**AUTODESK**

(2014-2016)

**SENIOR SOFTWARE ENGINEER**

*Fulfilled a critical cross-functional role in software development, mechanical design, and testing for components of the Spark 3D Printing Platform.*

- Engaged in research and development into electromechanical systems, with a focus on discovering opportunities to improve and extend 3D printing capabilities and improve print quality and reliability.
- Served as the architect of an import utility that translated competitor software settings for use by the Spark platform.
- Created nodeJS drivers for asynchronous USB and Serial communication to 3D printers.
- Aggregated and segmented data to build an API and database of consumer-grade 3D printer materials.

**COOPER LIGHTING**

(2012-2014)

**MANUFACTURING/SUSTAINING ENGINEER**

*Executed Build-to-Order mechanical design, process improvement, facilities troubleshooting, and engineering documentation within a union-operated environment focused on the production of high-end architectural lighting products.*

- Generated over \$100K in annual savings through cost reduction initiatives including issues affecting purchasing, fabrication, assembly, and quality control.
- Eliminated production delays through development of an ECR/ECO/ECN system and a standardized finishing process.
- Produced electromechanical designs and bills of material for standard and customized orders at approx 100/month.
- Designed and implemented a device that successfully mitigates a failure mode for multi-stem pendants. Accepted by patent committee and submitted to USPTO.

**SUNPOWER CORPORATION**

(2009-2011)

**PRODUCT DEVELOPMENT ENGINEER**

*Led the fulfillment of engineering product development responsibilities for commercial and residential scale rooftop photovoltaic products including planning, scheduling, design, and testing to meet all qualification, documentation, and release requirements.*

- Assumed ownership of an underperforming product qualification and documentation process to bring it to completion.
- Led extension of two products into European markets through rigorous analysis, qualification testing, and documentation.
- Completed a full product qualification process for introducing a building-integrated residential photovoltaic product.
- Performed wind analysis reduction and structural qualification guidelines for sites in the United States and Europe.
- Secured one patent grant as a result of designing for SunPower's product portfolio.

**COOL EARTH SOLAR**

(2008-2009)

**R&D MECHANICAL ENGINEER**

*Fostered the development of a functional prototype from concept to completion, demonstrating the viability of using metalized polymer membranes under pressure to concentrate and direct solar energy onto a power-generating receiver.*

- Carried out design, analysis, prototyping, and testing of multiple technical implementations for a dual axis tracking concentrated photovoltaic system.
- Responsible for the design, build, and successful demonstration of component integration including an optical concentrator tracking support frame, a low-cost single-phase heat exchanger, and a primary concentrator film restraint.

**Presentations**

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**RAPID + TCT: Improving Industrial 3D Printing with MRP Integration, Big-O Analysis, and Generative Geometry**May 2017 - [LINK](#)

*Applied the Toyota 3M Model towards a solution for Industrial Manufacturing Environments utilizing 3D Printing: In this presentation I described the benefits of a loosely coupled Enterprise Service Bus (ESB) Integrated 3D Printing as a Service Architecture combining Materials Requirements Planning (MRP) and Algorithms (Big O Analysis & Generative Geometry) to reduce waste, overburden, and unevenness in manufacturing environments deploying 3D Printing as an integral production method due to the inherent flexibility and on-demand production features inherent in the 3D Printing process.*

*Patents*

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**Active Fire-Blocking Wind Deflector**US 8763316 B2 - [LINK](#)

ISSUED March - 2012

*A rooftop photovoltaic solar system component which allows two configurations. In the first configuration the wind deflector comprises a deflecting portion adapted to deflect wind blowing on the rooftop above the rooftop array and a ventilation portion having a plurality of openings, the openings positioned to permit airflow under the rooftop array. The wind deflector assumes a second configuration upon release of a thermal fuse. In the second configuration, the deflecting portion is elevated from the first configuration and the ventilation portion is positioned to permit less airflow through the plurality of openings.*